REMARKS

Reconsideration of this application is requested.

The Examiner's indication that claims 5, 7, 8, 12 and 13 would be allowable if made independent has been noted. The dependence of these claims has, however, been retained as it is thought that, as amended, the claims from which these claims depend (i.e. claims 1 and 6) are also allowable.

Claims 1 and 6 have been amended to indicate that the compound of Formula (1) is not in the form of a metal chelate. This amendment was made in response to the PCT Written Opinion and the intention was to include this in the U.S. claims. See the Amended Claims filed in the PCT application and included with the present filing.

Claim 13 has been amended for consistency with claim 6, as amended.

Claim 6 has also been amended to include provision (vi) which further defines L^1 and L^2. Basis for this amendment is found at page 4, lines 32-34. This change takes into account references noted in the PCT International Search Report and International Preliminary Examination Report, namely DE 268488C; DE 67973C; DE 894423C; and GB 1569259, of record herein. The applicant's compounds as claimed are believed to distinguish patentably over these references.

Reconsideration of the double-patenting rejection and withdrawal thereof are requested in view of the attached Terminal Disclaimer with respect to U.S. 7,153,351.

The Examiner is respectfully requested to reconsider the Section 102(b) rejection of claims 1, 6, 9-11 and 15-18 as anticipated by Ciba Geigy (GB 741578) and the Section 103(a) rejection of claims 2-4, 20, 22 and 23 as unpatentable over the Ciba Geigy reference considered with Murcia et al. (U.S. 2001/0012027). The applicant's invention as defined by the amended claims is not disclosed in Ciba Geigy or obvious therefrom even if Ciba Geigy is considered with Murcia.

More specifically, Ciba Geigy GB 741578 (hereafter "Ciba") clearly relates exclusively to metallifeous compounds, i.e. metal chelates. The structures of Formulas (1) and (2) on page 1 of Ciba, for instance, clearly show the necessary presence of the metal in the compound. The applicant's claims, as amended, are, therefore, not anticipated by Ciba.

On the matter of obviousness, it is noted that Ciba is a very old document (1953) and predates the technology of ink jet printing by a long time. Accordingly,

the reference contains absolutely no teaching whatsoever with regard to use of the Ciba compounds in ink jet printing.

The other reference relied on by the Examiner, U.S. 2001/0012027A (Murcia et al.) also contains absolutely no teaching whatsoever about the nature of any compounds or compositions which may be suitable for ink jet printing. Instead, Murcia et al. relate just to printing hardware. Murcia thus gives no indication as to which dyes or compositions may be suitable for ink jet printing.

The applicant submits that, collectively, Ciba and Murcia et al. do not suggest the present invention. Typically, it is not possible to predict whether any particular dye will be a dye suitable for use in ink jet printing as such application has very demanding performance requirements for a dye as detailed on page 1 of the present application.

Further evidence of the non-obviousness of the claimed subject matter is provided below. It may be of interest to the Examiner to note that this evidence was submitted during the PCT stage of the parent PCT application and was persuasive of the non-obviousness of the applicant's invention. While recognizing that this is not binding on the Examiner, it is thought to be useful to the Examiner in reconsidering the applicants' invention.

Experimental Evidence

The difference between the applicants' invention and the subject matter of GB 741578 is that the prior art discloses compounds which are chelated with a metal, whereas a key feature of the present invention is that the compounds of Formula (1) are not in the form of metal chelates.

The technical effect provided by this difference is that the compounds of Formula (1) demonstrate superior properties when used in ink jet printing while still being cost effective to produce and also environmentally friendly (they do not contain metals).

The applicant has found that the compounds of Formula (1) demonstrate both superior ozone fastness and relative optical density readings when compared with metallized compounds. These surprising advantages are demonstrated by the following experimental evidence.

Four dye compounds as shown below were prepared and used to make inks for ink jet printing. These compounds comprise a non-metallized compound

according to the present invention (dye 1), a commercially available metallized compound (dye 4), a commercially available non-metallized compound (dye 3) and a further metallized compound (dye 2).

The compounds were formulated into inks and the inks printed on a variety of substrates. The substrates were then tested and the relative optical density measurements and ozone fastness results compared. As can be seen from Table 1, the relative optical density measurements for dye 1 (that is, example number 23 from the current application) are all higher than the other dyes tested on a variety of substrates resulting in a superior depth of shade of the black ink. Consequently, the compound according to the present invention can be seen to produce superior black prints on a variety of print media compared to both commercially available metallized and commercially available non-metallized dyes as well as metallized dyes (for example dye 2) analogous to the dyes of the present invention.

Furthermore, it can be seen from Table 2 that the non-metallized compound according to the present invention (dye 1) also provides superior ozone fastness results compared to equivalent metallized compounds (dye 2) and also to commercially available metallized and commercially available non-metallized compounds. That is, the lower the % optical density loss of the print, the greater the fastness of the dyes in the inks to ozone.

Fastness to ozone is a particularly important requirement for dyes used in ink jet printing today, especially on the commercially available porous media used throughout the industry. It is highly desirable to use porous media for ink jet printing because such media facilitate faster printer speeds. However, the porosity of the media has the adverse effect that dyes printed on the media are more susceptible to atmospheric ozone and subsequent degradation. It is, therefore, a requirement of the compounds according to Formula (1) of the present invention that such compounds are themselves resistant to ozone and particularly resistant to ozone when printed on porous media.

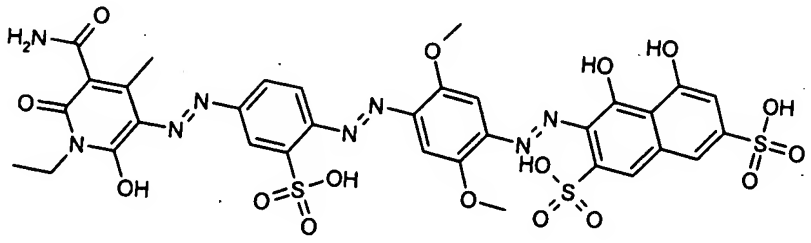
The use of compounds according to Formula (1) of the present invention in compositions for ink jet printing processes, therefore, facilitates the production of more efficient prints by more efficient and cost effective printing processes. It is, therefore, submitted that the use of compounds of the claims is non-obvious from the prior art.

Experimental Details

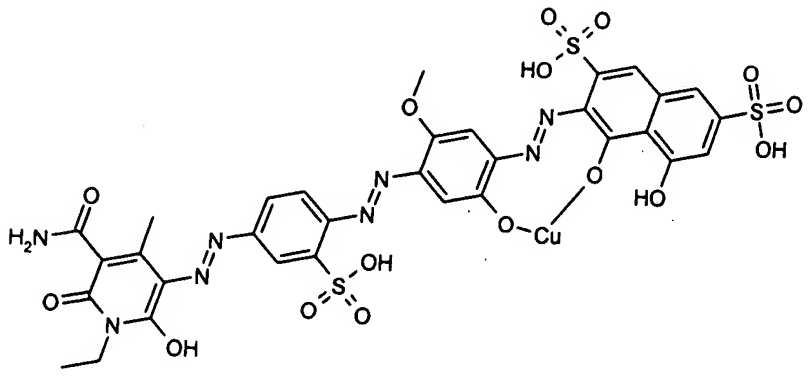
The following four dyes were used to prepare inks according to the following formulation.

Ink Formulation	
3.5%	Dye
9%	Thiodiglycol
9%	2-Pyrrolidone
1%	Cyclohexanol
15	Surfynol 465
76.5%	Deionized water
pH	8-9

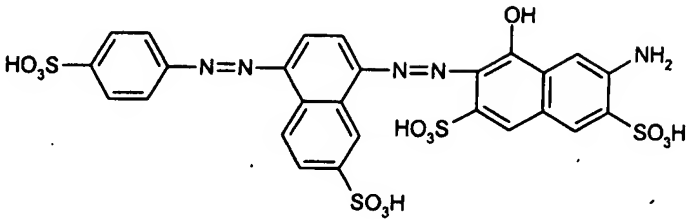
Dye 1 – Example 23 (claimed invention)



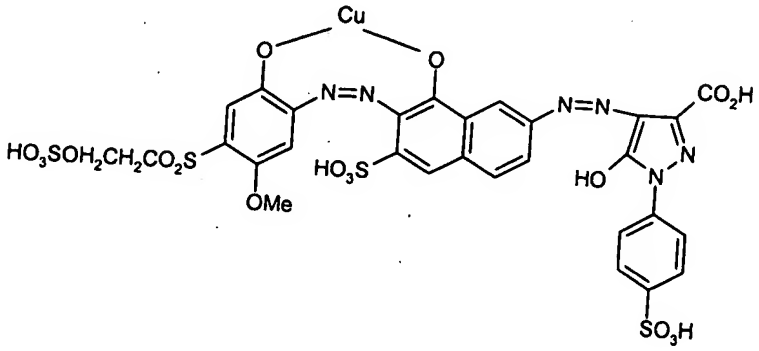
Dye 2 – Example 31 (metallized)



Dye 3 – Commercial non-metallized dye



Dye 4 – Commercial metallized dye



Print Tests

The inks described above were ink jet printed onto a variety of papers using a Canon i965 ink jet printer. The CIE color coordinates of each print (L, a, b, Chroma (C) and hue (H)) were measured using a Gretag Macbeth Spectrolino Spectrodensitometer™ with 0°/45° measuring geometry with a spectral range of 380-730 nm at 10 nm spectral intervals, using illuminant D65 with a 2° (CIE 1931) observer angle and a density operation of status A. No less than 2 measurements were taken diagonally across a solid color block on the print with a size greater than 10 mm x 10 mm. The properties of the resultant prints are shown in Table 1 below, where the example number of the dye used to prepare the ink is indicated in the left-hand column, and ROD is Relative Optical Density. The print substrates mentioned in Tables 1 and 2 were as follows:

	Number
HP Premium Plus (swellable photographic paper)	1
Canon PR 101 (porous photographic paper)	2
Epson Premium Photo (porous photographic paper)	3
Xerox acid (plain paper)	4

Table 1

Dye	Substrate	ROD
3 (Non-metallized)	1	1.95
4 (Metallized)	1	1.88
1 (Example 23)	1	2.16
2 (Example 31)	1	1.90
3	2	1.88
4	2	1.86
1	2	2.17
2	2	1,85
3	3	1.97
4	3	1.88
1	3	2.29
2	3	1.90
3	4	1.13
4	4	1.09
1	4	1.25
2	4	1.10

Ozone Fastness

The four inks were printed onto the porous media substrates shown in Table 2 using a Canon i965 ink jet printer. The printed substrates were then assessed for ozone stability using a Hampden model 903 ozone test cabinet. The test was carried out for 24 hours at 40°C and 50% relative humidity in the presence of 1 part per million of ozone. The fastness of the printed inks to ozone was judged by the difference in the optical density before and after exposure to ozone using a Gretag Macbeth Spectrolino Spectrodensitometer. The results are shown in Table 2 where the dye used to prepare the ink is indicated in the left-hand column. The lower the %OD loss, the greater the ozone fastness. These ozone tests, therefore, clearly demonstrate that inks based on ink compositions comprising non-metallized dyes of the present invention display superior ozone fastness as required by the porous print medium used in the ink jet printing field.

Table 2

Dye number	Substrate	% ROD loss
3	3	45.2
4	3	34.6
1	3	16.2
2	3	54.2
3	2	49.5
4	2	65.2
1	2	23.4
2	2	70.3

In summary, the applicant submits that his claims, as presented herein, distinguish over the cited art and define subject matter which is not only new but unobvious from the art. Accordingly, withdrawal of the Section 102(b) and Section 103(a) rejections with allowance of the claims is requested.

Respectfully submitted,

MORGAN LEWIS & BOCKIUS LLP

By _____

Paul N. Kokulis
Reg. No. 16773

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Customer No. 09629
1111 Pennsylvania Avenue, N.W.
Washington, D.C. 20004
Phone: (202) 739-3000
Facsimile: (202) 739-3001
Direct: (202) 739-5455